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FROM ANIMAL TO MAN.

THERE was a time when science was content to confine herself to inorganic nature. Life was a mysterious principle unrelated to the forces of nature and therefore a field for philosophic speculation, but not for exact knowledge. But this region has already been subdued by science. Already life is correlated with other forces of nature, and biology has fairly entered the ranks of progressive sciences. And now at last the border which seemed so long to separate impassably biology from psychology has also been crossed by science in her daring march. Here at last we touch the highest phenomena, and science seems indentified with philosophy in subject-matter if not in method.

My object now is to touch some points in this borderland, but only briefly and lightly in the way of suggestion. What I now say may be regarded as a continuation of the lines of thought suggested in my previous writings on the relation of man to nature and especially to the animal kingdom. In these previous writings I try to show that, without violating the analogies of nature we may conceive the spirit of man as having arisen by progressive individuation from the forces of nature. That it existed first in inorganic nature as a potentiality, in plants as a germ, in animals as an embryo, which finally came to birth in man. In this paper I wish to fix attention on this last change and show in what it consists. I wish to show what is the essential difference between the spirit of man and the *anima* or soul or intelligent principle of animals.

This question lies at the very basis of philosophy. It is the question most fundamental of Locke, Hume, and Kant, viz.: the origin of knowledge from sense-impression. It is more: it is a question which touches the origin of all that is characteristic of man —art, language, society, morals, religion, science—and is thus closely bound up with all our dearest hopes and noblest aspirations. But under the new light now shed on every department of thought by the theory of evolution, it must be approached in a new way and investigated in a new spirit. For if this subject lies at the basis of philosophy, it is now shown also to form the very summit and crown of all science. If ever we are to have a comprehensive and rational philosophy of nature and man, science must solve this question.

In the past, man, body and spirit, has been studied too much apart from nature. Thus the anatomy, physiology, and embryology of man were separate sciences. This is no longer possible. The comparative method is the great method of discovery in all the more complex departments of science. This method has been successfully applied to all that concerns the human body. The time has come when it must also be applied to the human spirit. Anatomy did not and could not become scientific until it became comparative anatomy; physiology and embryology until they became comparative physiology and embryology; so also psychology will never become truly scientific until it becomes comparative psychology,—until the mind of man is studied in relation to those foreshadowings and beginnings of mental phenomena, which we find in animals and in infants. This is just what psychology is waiting for to-day.

But there are two opposite dangers against which we must guard. The older thinkers saw an infinite gulf between man and animals and therefore thought lightly of the apparent likenesses. Modern science, on the contrary, recognises and rightly insists on the resemblances, but seeks to minimise the differences. Now the only rational attitude is to admit with the evolutionists the close resemblance and even genetic connexion, and with the older thinkers the enormous differences; and then try to reconcile these two very diverse facts.

Admitting then both the close resemblance and the immense difference, admitting also the genetic connexion—the one having come out of the other by a process of evolution, I wish to show in a general way in what consists the essential difference—to put my finger as nearly as I can on the dividing line where humanity emerges out of animality.

This I know is a difficult problem. The acutest minds have striven in vain to solve it. I am not so vain as to imagine that I can do so completely. It can only be done by a profound critique combined with far wider and more accurate knowledge than we yet have of the psychical phenomena of animals and of infants. All I can hope is to contribute something, however small, towards its solution, by bringing forward an assemblage of differences each one small at first, but a germ from which something distinctive of humanity seems to grow; each one perhaps unsatisfactory by itself, but each strengthening the others, and therefore all together convincing; each in some sense similar to all the others and therefore strongly suggestive of common origin. Of these several differences, we take up first those which seem simplest, in the hope that these will furnish a key which will help us to understand the others.

I. SPEECH.

This has always and justly been regarded as one of the most important distinctive characteristics of man and some make it the one essential distinction from which all others arise. But dogs may be taught to understand human speech and parrots may be taught even to speak intelligibly. Now, what is the difference between such parrot speech, or better, between human speech as understood by a dog and the true rational speech of man? Some will doubtless say that parrot speech is mere succession of imitated idle sounds signifying nothing—associated with no idea or object in the mind of the parrot. But I am sure those who have observed closely will agree with me in thinking that in them, words and phrases are sometimes associated with objects and actions. When she says, "Polly wants a cracker," she means what she says. When she says, "Bring in breakfast," she expects food to be set on the table. Amid much idle repetition, there is certainly often a dim association of word and thing. What, then, is the difference between this and human speech? I answer in brief: It is just the difference between sign-language and rational speech; meaning by sign-language all movements or sounds which by repeated collocation become associated with things or actions or emotions.

Sign-Language Versus Rational Speech.

All the higher animals have their cries of fear, rage, and pain, or notes of pleasure, joy, and love. Social habits, in default of notes, necessitate other and more elaborate means of communication. Ants, for example, undoubtedly exchange information by touching antennæ. The sign-language of deaf-mutes is mostly the same, although the rational human mind always puts something more into it. The alphabetical sign-language of mutes is of course of a higher order and a strictly human sort.

Now, words as well as gestures may be only signs; and speech may be only word-sign language. Words may be only the signs of things, so that by frequent collocation the word suggests the thing and the thing the word. This is the best that can be said of parrot-speech or of the speech of man as understood by the dog. Such speech does not differ except in degree from the movements of an intelligent dog who wishes to make known his wants to his master, or the sign-language of an ant who tells his fellow of a fortunate find. In this sense all animals talk. It is true that in the case of the parrot the words and phrases have been learned; but by frequent collocation of words and things the two become associated in the mind so that the words are no longer idle sounds.

But it will be asked, Is it not the same with all language? Does not the child, too, merely learn the words, and, by practice, to utter them? Does not the child, too, by frequent collocation of word and thing learn to associate them? Yes, true. All the speech of earliest childhood is nothing more than this word-sign language, this imitative parrot-speech. But true rational speech is different; and if we watch closely we can observe in the history of every child, the one kind change into the other. The process is as follows:

The child by frequent collocation learns to associate certain words with certain things, and *vice versa,* then to use the words as signs of the things; then a phrase (to him only a long word) to indicate a certain action. This is all parrot-speech, although far more perfect than that of any animal. But at a certain time, sooner or later, there comes something more, not only more perfect, but different; not only a growth, but a birth. At a certain time the child perceives the power of words in *relation* to one another. This is a perception, not of a thing, but of a relation. Or if we call it a thing, not a material, sensuous thing, but an intellectual thing. He analyses phrases which before were to him only long words, and perceives the power of each part in relation to other parts. Immediately he is able thereby to make new, untaught combinations. He invents new phrases, creates original sentences. There is now for the first time a grammar in its language. There is no longer any limit now to new combinations. Some of these new combinations give rise to strange and even laughable phrases, which are repeated by the fond mother as the smart sayings of her darling.

Now just here true rational speech, characteristic of man, begins. All else follows as a necessary consequence. Words are combined into phrases, phrases into sentences, sentences into paragraphs, and paragraphs into the most complex pieces of thought-work. But all before this is mere sign-language, not differing except in degree from that of animals. Many animals, especially the dog and the monkey might be taught such language if their vocal and articulating organs were suitably formed; but the second stage no animal can attain, for want of the mental faculties necessary.

As word-sign language, so gesture-sign language may become rational by the presence of the necessary mental faculties. Thus the sign-language of deaf-mutes may be truly rational, being informed by the rational mind.

The difference here pointed out between word-sign language and rational speech is similar to, and may be illustrated by, the difference between written and spoken language. As in rational speech, the phrase-word is analysed into its component words, and the separate powers of these components in their relation to one another is perceived; so in written language the analysis goes one step farther, and each word is analysed into its component sounds, and the power of each sound in relation to other component sounds is perceived. The first analysis is connected with the birth of human reason; the second with a higher stage of culture only.

I leave to others of greater acuteness to follow up the distinction here pointed out. My object now is to give a whole assemblage of similar distinctions, each one only in outline, trusting to their combined effect for the conviction I seek to produce. I wish to show that in all the faculties of the human mind as compared with the corresponding one in animals, there is a distinction similar to that already pointed out.

II. USEFUL ART.

The gradation between the constructive art of animals and the lowest art of man is very complete. It is, therefore, more difficult to draw the line sharply here. Yet a little reflexion will show where it must be drawn and that it is of the same kind as that already pointed out under the last head.

The constructive art of animals, as shown in the nest-building of birds, the dam-building of beavers, the complex galleries of ants, the hexagonal honey-cells of bees, is apparently only the final result of a succession of blind, divergent trials and survivals of best methods, continued through successive generations, and conserved in inherited brain-structure, until a really marvellous excellence is sometimes attained. The successive improvements under such blind trials and survivals seem to be wholly unconscious and unintentional, and, therefore, exactly like the improvement of the organism itself under divergent variation, struggle for life, and survival of the fittest. It is, in other words, unconscious evolution of constructive methods. This is what we call instinct, and it is in this way that the most wonderful instincts have been gradually formed. That we have rightly interpreted the significance of such art is shown by the fact that its excellence is in no wise proportional to intelligence, but rather to the fixedness of habits and the narrowness of the line along which improvement has taken place.

But the constructive art of man, even the rudest, has always another, a reflective element. In man's work there is always a distinct conscious purpose or idea which he deliberately tries to attain. Furthermore, there is always in man a perception of law: unconscious, intuitive perception it may be, i. e., perception by methods which he does not stop to analyse and could not analyse if he would—but still a dim perception of the laws of nature underlying his work. In art, as in all else, man is always inventive—creative; and even the inventive genius of a Watt or an Edison is only a higher form of that which distinguishes man, even in the lowest stages, from animals.

But here again, in art as in language, we find on the human plane two grades, and the distinction between these two grades is perhaps more easy to draw than between the human and the animal. The two grades referred to are empiric art and scientific art. Empiric art is the result of dim, unconscious, intuitive perception of law; scientific art, of the clear, conscious perception, the rational knowledge of the laws of nature. Man originates and improves art by incessant trials, not indeed wholly blind, as in animals, but guided only by the dim light of intuitive reason. By this method alone, through successive generations and perhaps aided, as in the case of animals, by inherited capacity, a high degree of excellence may be attained. But sooner or later such art is arrested and either petrifies or decays. But if under the stimulus of such art science be once awakened, then the principles underlying the work are analysed and understood, and art becomes scientific and thereby becomes endowed with a new and higher life and thenceforward indefinitely progressive. Thus in this as in all, there is for man a human life and a higher life. The one separates him from animals, the other separates him from his lower self.

III. FINE ART—MUSIC.

I suppose most persons would say that it is in music—bird-song—that we find the nearest approach to man. Who has not been charmed by these songsters of nature? Who will deny that the pleasure we thus derive is really of a very high order? But the very fact that it is of a very high order ought to make us suspect that its source is all other than is usually supposed. There is, I am convinced, a profound difference between bird-song and human music, and that the pleasure we derive in the two cases has an entirely different source. I would go farther and say that, as the speech of parrots is no true rational speech, so the song of birds is no true music; it has no real æsthetic quality in it. Let me explain.

Beauty versus Sense-Agreeableness.

Sugar affects our gustative nerves agreeably, and quinine disagreeably. But no one would think to call this pure sense-pleasure beauty. So odors affect us with pleasure or pain, but no one would think of dignifying such pure sense-pleasure with the name of beauty; because these lower senses are not closely connected with the higher faculties of the mind. But in the higher senses, so close is the connexion between sense-pleasure and the higher emotions, that the two become confused in the popular mind, and, therefore, in popular language. Thus we often speak of a beautiful sound or of a beautiful color, whereas the proper word is sweet; for the pleasure derived from a pure sound or a pure color is on the same plane as that derived from sugar. It is pure sense-agreeableness, and nothing more. But take two colors, place them side by side, and compare them. Now something more and higher is at once perceived. Each color, as before, affects us agreeably (sense-pleasure), but in addition we perceive the *relation* between, whether of concord or discord. This is an intellectual perception, not a sense-perception. It is a perception of a relation, not of a thing. The effect is not on the plane of sense, but on the plane of mind. Here, then, is the simplest possible perception of beauty,—beauty reduced to the simplest terms. The harmonious combination of color with color, of form with form, and these two again with one another becoming more and more complex, and therefore higher and higher, constitute the whole art of painting.

So also is it with music, and the principle is best illustrated in this department. A simple sweet sound produces in us, not the feeling of beauty, but only a sense-pleasure. The æsthetic emotion, the so-called sense of beauty (see how hard it is to avoid the language of sense) is and must be at least one step removed from the plane of sense. But suppose we make two sounds, either consecutively or together. Now we perceive, as before, each sound (sense-perception), but we perceive also something else which is not sense-perception. We perceive the relation between the two sounds, whether concordant or discordant. If concordant, we call it harmony, consecutive or chordal. This is beauty or æsthetic feeling reduced to its simplest terms,—the simplest elements of music as distinguished from mere sense-pleasure. These simplest harmonies are then combined into musical phrases, phrases into strains, strains into songs, and songs into the most complex choral or orchestral music. As the relation becomes more complex, the result is removed more and more from the plane of sense, becomes more and more intellectual, but also more and more difficult to appreciate without long culture.

The outcome of the whole argument is this : the simplest element of beauty is still one step above the plane of mere sense. It is an intellectual perception, not a sense-perception. It is a perception, not of a thing, but of a relation ; or, if we must call it a thing, then I would say that it is the perception of an intellectual thing, not of a material thing. As art becomes higher, the perceived relations become more complex and difficult to grasp, the intellectual thing becomes more and more removed from the plane of sense.

It is easy now to see why true art is confined to the two higher senses. It is because of the great variety of the sense-impressions in these and therefore the complexity of the relations amongst these impressions. It is conceivable, however, that there may be a low kind of fine art connected with these lower senses of taste and smell. It is possible that by a skilful combination of tastes with tastes and smells with smells, and these two again with one another, the arts of cookery and perfumery may rise one step above the plane of sense. If so, we would not advise a special cultivation in the enjoyment of this art ; because from the dominance of the sense-element there is danger that the intellect may be dragged down toward the plane of sense, and thus debased, instead of the senses raised toward the plane of intellect, and thus refined; which I need not say is the true end of art.

Application.

But to return and apply these principles,—I do not believe that birds either make or appreciate music in the sense above defined. I am aware that many think differently. I know that some have even attempted to set bird-music to scale. But for myself, although I have a very keen appreciation of harmony—and perhaps for that very reason—I have never been able to assure myself of any true purposive harmonic relation among the consecutive notes of bird-song. Sometimes there seems to be, and sometimes not. When there is, it seems to be accidental and unintentional. The very best that we can accord to bird-music is what we have already accorded to the constructive art of animals. It is probable that by blind divergent trials and survivals of the sensuously best or most agreeable results, continued through successive generations, not only have the notes of the birds become sweeter, but also perhaps some simple harmonic relations may have been attained ; not, however, because such harmonic relations were perceived and enjoyed as relations, but because there is probably also a sensuous element, a sweet nerve-thrill in harmonic vibrations. In any case, even those who think that they perceive real music in bird-song must admit an enormous difference between it and human music. Sing it, play it on an instrument and see if we derive any pleasure at all from it. The difference is fundamental. Man creates combinations of sound purposely and indefinitely. He combines sounds into chords, chords into phrases, phrases into strains, strains into songs, and songs into choruses. Birds never reach beyond simplest phrases, and these not created but learned and repeated or else inherited, and even so only sensuously not æsthetically enjoyed.

I have often in early life and once again recently listened to what might be called choral music in birds. The red-winged blackbird and our western meadowlark, often in great numbers sing together filling the air with their "sweet jargoning." But although the effect was delicious I could not detect any real concord. It was after all only sweet jargoning. The pleasure was evidently of an entirely different order from that derived from music; and similar to that derived from the sounds of nature, such as the rustling of leaves or the murmuring of streams.

But the question again returns whence then the exquisite delight we derive from the song of birds? Why the ecstasy of poets over the skylark and the nightingale? And why do we, who are not poets, but love poetry, sympathise so deeply with the poets in this regard? I will try in homely fashion to explain the real source of this pleasure.

Suppose then all conditions favorable, bright spring-morning, romantic spot, deep woods, and murmuring stream. Suppose farther the ubiquitous small boy with glass-tube whistle and tumbler of water, hidden from view and trilling the joyous notes of the canary. It is easy to imagine our rapturous delight—a delight intense and pure and just in proportion to the refinement of our nature—so long as we are deceived; but all pleasure immediately vanishes as soon as the imposture is detected. But why? If there be any real music in bird-song, we ought equally to enjoy the whistle. But, on the contrary, all that is left is some sense-pleasure of sweet sounds and perhaps some intellectual pleasure from clever imitation, but of æsthetic pleasure there is not a trace.

What is the source then of the high delight in bird-song? Some sense-pleasure of sweet notes doubtless, but what else is added, elevating, refining, ennobling this sense-pleasure? I answer, not æsthetic pleasure of music; but sympathy with joy, with happiness, in the humblest of God's creatures. There is nothing nobler, higher, purer than this sympathy with nature in all its aspects and sounds, with murmuring streams, rustling leaves, and singing-birds. It is the sympathy of the spirit of man with the infinite spirit of nature which is the spirit of God in nature. But its noblest form is sympathy with happiness in animals; for animal-happiness is the harmonious activity of the whole being according to its nature, and is therefore the symbol of that higher spiritual happiness which is the holiness, the blessedness, after which we all sigh. The pleasure above mere sense which we take in the songs of birds is of the same order as that we take in any exhibition of pure animal-joy; in gambols and skipping of lambs, the mad bounding of colts, and the merry laughter of children. If we call it music, then it is the grand chorus of nature in which bird-song is but one single note.

But if there are those who would object to this view, and would make bird-song a real music, thus lifting birds into the human plane in this regard, there are not wanting others who would accomplish the same result by dragging down human music, indeed everything human to the plane of the animal. Many of the materialistic school of modern philosophy insist that all music is on the plane of sense, —is naught else than successive pleasurable nerve-thrills,—and that harmony or what we call a perception of relations is but unison of nerve-thrill with nerve-thrill to form a still more delicious compound-thrill. The answer to this is plain. In consecutive harmony, the combination occurs in memory only and therefore no compound nerve-thrill is possible. Again, what shall we say of the ecstasy of deaf Beethoven while composing his exquisite symphonies. Is this nerve-thrill? Thrilling of the auditory nerve in the deaf? Is it not rather soul-thrilling?

I need hardly say that the pleasure which some animals seem to take in human music, if they take any, is of a purely sensuous kind and not at all æsthetic. It is an enjoyment of sweet sounds, not of harmonic relations; it is delicious quivering of nerves, not a thrilling of soul.

What I have said of music applies, *a fortiori*, to all other forms of fine art. Music is the simplest and most fundamental of all arts, although for that very reason most highly developed. It is not pretended that other forms are found among animals, or possible for them.

IV. THOUGHT.

Thus far we have spoken of sensible results; of characteristic manifestations of human activity in language and in art, both useful and fine. We come now to speak of the powers underlying and determining these characteristic results.

Perhaps in no department has there been so much discussion as to the relation of man to animals as in the department of thought.

What is the relation of instinct and intelligence in animals to reason and thought in man? What is the origin of rational knowledge so characteristic of man? These are among the deepest questions of philosophy. I can, of course, touch them only in the lightest way, but as I touch them from the scientific side, I hope not without addition of some new light.

First of all, to make myself intelligible, it is necessary to distinguish between instinct and intelligence in animals. And then we shall be better prepared to distinguish between animal intelligence and human intelligence or reason. It is with this latter distinction that we are chiefly concerned.

Instinct Versus Intelligence.

It is common to imagine that instinct and intelligence are two corresponding but mutually excluding endowments, the one characteristic of animals, the other of man. But nothing is more certain than that both of these coexist all along the line from the lowest animals up to man; although in varying, almost inverse proportions. In man and animals alike there is a variable and an invariable element in conduct or activity. The former belongs to intelligence, the latter to instinct. Under a previous head, in speaking of the constructive art of animals, I said that it is the result of blind divergent trials and survival of best methods integrated by inheritance through successive generations, until the integrated sum may become large and the resulting art even more perfect than the lowest art of man. Now, the integrated sum is called instinct, while the individual additions must be credited to another and more voluntary faculty which we call animal intelligence. All wise conduct or activity adapted to ends is the result of experience; but the experience is partly individual and partly ancestral or inherited. Of the whole experiential wealth, the inherited bank-account belongs to instinct, the individual acquirement to intelligence. Now it is easy to see that in proportion as the conditions of life are narrow and fixed and the habits of animals limited to certain lines, in the same proportion will such activity become fixed in habits, and such habits petrify in inherited brain-structure as instinct. Thus it is that perfect instincts are incompatible with high degree of intelligence, and therefore that in animals instinct, in man intelligence, greatly predominates. In animals the inherited bank-account is large and the individual acquirement small; while in man, although the bank-account is still large—much larger than usually supposed—yet the individual acquirement always predominates.[1]

Animal versus Human Intelligence.

But there is a profound difference between animal intelligence and human intelligence or reason; a difference which is shown by the tendency of the former to integration and fixation as instinct. Intelligence, whether animal or human, works always by individual experience, but the individual experience is very different in the two cases. Experience, whether in man or animals, comes by trials; but the trials of animals are blind trials in all directions (divergent), and only by survival of the best methods is the end reached; while those of man are directed by thought to the desired end. Thus the individual acquirements of animals are the result of blind divergent variation of conduct and the survival of the best in useful habits, which habits are again finally embodied by inheritance in instincts; while the acquirements of man are the result of creative, purposeful thought. It may, indeed, be hard to draw sharply the line between the blindly experimenting intelligence of animals and the thoughtful intelligence of man, and all the more so because there is so much of the animal kind in man himself; but there is undoubtedly in man a wholly characteristic element, small it may be at first, but constituting a new departure with infinite consequences. We will attempt very briefly to indicate what is the essential nature of this new element.

Perhaps it may be put in a few words thus: animals perceive objects or things only. Man perceives also the relations and properties of things abstracted from the things themselves, and thus forms conceptions or general ideas. Comparing with music: as there is a sense-pleasure (nerve-thrilling) and an intellect-pleasure

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[1] See an article on "Instinct and Intelligence," *Popular Science Monthly*, for October, 1875.

(soul-thrilling), and all true music comes out of this latter, so there is a sense-perception and an intellect-perception (conception) and all rational knowledge is founded on this latter. Or, again, comparing with language: as all rational speech is founded on the perception of the power of words in relation to one another, and therefore the meaning of words expressing such relations; so rational knowledge is based on the perception of relations and properties abstracted from things, and this perception, therefore, must precede rational speech. External, actual things are the objects of sense, properties and relations which are *internal, ideal* things are the objects of thought. And this, be it observed, is only the lowest plane of thought; for the thoughts about these relations, and the relations among these thoughts, become in their turn the objects of thought.

In a word, animals perceive things only, or if in some sense relations also, only as embodied in, as belonging to, never as abstracted from, the things. Man perceives not only things, not only relations and properties embodied in things, but abstracts these from the things and considers them separately. Animals have, given them, percepts only; man in addition forms, creates concepts also. And since such concepts are not given, but created by him, there is no limit to their number and variety. They become more and more general, more and more complex, more and more abstract as we rise in the scale of reason. Now, since all knowledge is based on concepts or ideas only, it follows that what seems like knowledge in animals is instinct, and this in its turn but the inherited sum of the results of divergent purposeless trials, and never the result of abstraction or general ideas, applicable—as all general ideas are—beyond the limits of actual experience. In other words, in all true knowledge there are two elements, an external and an internal. Nature, through sense, furnishes the material; mind, by thought, shapes, lays, and cements according to a plan or idea. Now, animals are slaves of sense; there is no creative work of mind. Of the elements of knowledge they have but the one. They have materials, but no builder, and therefore no edifice of knowledge; or, if a seeming edifice, it grew—was not built.

But some will object that animals must perceive relations between themselves and external things; for how otherwise could they adapt themselves to external things? I answer: In animals there is indeed a kind of *practical awareness* of external relations, which guides their conduct more or less wisely. In men there is all this, but also something more, viz.: a clear reflective cognition of relations as relations,—of relations abstracted from the things related,—which relations thus become the objects of thought and the basis of all knowledge.

To illustrate, take, for example, number: animals distinguish one thing, two things, three things., but have no idea of number abstracted from things. Now it is from this latter alone that comes arithmetic and algebra and indeed the whole science of number. Again, space: animals perceive space occupied by objects, but have no conception of space abstracted from its contents. But geometry, trigonometry, in fact, the whole science of space comes from this latter. Again, time: animals cognise time in so far as it contains events, but not time as abstracted from contained events, yet the whole science of time or history, even history of our own lives, comes out of this latter.

V. IMAGINATION.

I think, from the preceding, we may assert that animals only re-present in the mind as images what had already been presented to it in experience. In them there is therefore only reproduction of experiences. There cannot be in them therefore a real, i. e., creative imagination. It is true, man too is limited to experience for the materials out of which he makes pictures by the imagination, but only for the materials. These materials he combines in an infinite variety of ways and thus composes pictures which may never have existed in his own or in any other experience. No such creation of pictures, by new and original combinations, it is believed ever occurs in animals.

But it will be objected, Do not animals—dogs, for example—dream and are not dreams pure creations of the imagination? I answer, though we cannot enter into their consciousness, yet we may be sure that nothing appears in their dreams which has not already appeared in their experience. In their dreams they only go over again the exciting incidents of the chase previously enjoyed. The dreams of man, on the contrary, although they too are compounded out of materials furnished by experience, yet these materials are united in an infinite variety of ways so as to form new and often improbable combinations—are woven into strange and fantastic patterns. Human imagination is literally creative always. The power of making new combinations, of creating pictures, by the imagination, whether waking or sleeping, is essentially characteristic of man; the power of doing so with beautiful results is characteristic of genius. If the creative imagination even in its lowest form be characteristic of man, how much more must the higher form, and its beautiful result—fine art—be characteristic of him.

Reveries are but day-dreams. In a waking state we also exercise the creative imagination in constructing fantastic, improbable pictures; only in this case we do not mistake them for objective realities as we do in dreams. We build castles in the air both waking and dreaming, but in the former case we recognise their unsubstantiality. Now if we are right in what precedes, then reveries also are characteristic of man. But if reverie then also hope, and if hope then also memory, is characteristic of man. Animals live only in the present, man also in the past and future. If it be objected that animals profit by experience and therefore must have memory, I answer: so do they provide for the future and yet they obviously have no idea of the future. Provision for the future is in them only conduct without definite purpose continued from generation to generation, because the result is good and therefore in the struggle for life prevails over other conduct—a mere survival of the fittest conduct. Even so I believe memory in them is apparent, not real. They profit by experience; yet I suppose such experience does not seem to them as localised in the past but as present, as in their dreams. The re-presentation of a past experience is to them like a present reality, only less vivid. As they have no idea of time as abstracted from events, they cannot have any idea of a history of self.

VI. CONSCIOUSNESS AND SELF-CONSCIOUSNESS.

External objects affect the sense-organs. The impression is carried as a vibratory thrill or else as a propagated chemical change along the sensory fibres to the nerve-centre and determines there certain physical changes which in turn determine—how we know not—changes in consciousness which we call sensations, perceptions, images, etc. Immediately there is set up a return series of changes, viz.: change in consciousness which we call will, corresponding change in nerve-centre, propagated change along the motor-fibres, contraction of a muscle, movement of a limb, and changes in the external world. Thus through the nerve-system, with its receptive organs, the senses, and its executive organs, the muscles, is established action and reaction between an outer and an inner world. In animals this is absolutely all. But in man there is something more. The sensations, perceptions, images thus produced, become themselves the objects of perception and thought (reflexion), and still more, the mysterious self in which these phenomena inhere becomes itself the object of consciousness and thought (self-consciousness). Thus there is a consciousness, the objects of which are the facts of the outer world, and there is an inner consciousness the objects of which are the facts of consciousness. There is consciousness and a consciousness of consciousness, or consciousness in the second degree. There is a sanctuary and an inner sanctuary of consciousness. Now it is this higher, inner consciousness, this consciousness in the second degree, this consciousness of self, which is the characteristic of man. In the history of every child there is a time when self-consciousness emerges, or is born, out of the mere animal consciousness. At that moment it seems to me, the child rises out of the animal into the human plane.

I remember with great distinctness the time when consciousness of self first became clearly present to my mind, and the sense of mystery, the wonder, the awe it produced. I well remember the difficulty of imagining that others too felt, as I did, this infinite mystery of selfhood. With this undoubtedly comes the sense of personal identity and therefore of continuous personal history and therefore also of true memory. Paradoxical as it may seem, I do not believe that animals have what we know as memory. Images of previous experiences are reproduced in their minds and determine appropriate actions, but the idea of personal identity and therefore of these experiences as belonging to a self, existing at a previous time, I believe is not possible ; and without a sense of continuous history there can be no true memory. The proof of this is I think to be found in observation of the phenomena of infants taken in connexion with our own remembered history. There can be no doubt, as shown by Preyer,[1] that a child one year old is already advanced far above the level of any animal. And yet such a child has, I think, no consciousness of a self, no sense of a continuous history, no true memory of experiences as belonging to a self, and therefore no future or past, no memory or hopes. All this, according to my own experience and observation, comes between two and three years of age and therefore at a time when the child is already raised far above the level of any animal. If our view is correct, this is the reason why our own remembered history extends back only to about this age. It extends only over the period of self-conscious, rational, personal existence.[2]

If the childhood of the race be anything like that of the individual, we can easily imagine the sense of wonder and mystery produced by the newly-awakened recognition of selfhood. This accounts for the active, fantastic, but often beautiful, play of the imagination amongst early peoples.

All that is distinctive of man comes out of this consciousness of self. We have already shown how all science, all rational knowledge grows out of the power of abstraction. Now, the idea of self is an abstraction from the facts of consciousness. Moreover, it is the highest and most complex of all abstractions, and the necessary condition of the development of all other abstractions into clearness. It is, therefore, the underlying condition of science, philosophy, art, religion, rational organisation of society, in a word, of indefinite progressiveness. Animals cannot have it, or they, too, would have their science, philosophy, art, religion; they, too, would be indefinitely progressive; they, too, would be rational, morally responsible beings; in a word, they would in all essential respects be men.

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[1] *Die Seele des Kindes.*

[2] Doubtless what we call memory in animals is the embryo of true memory of man. There are in fact three kinds or degrees of memory. (1) Unconscious inherited tendencies of growth in the embryo, by which the outlines of phylogeny are repeated in ontogeny. This is *organic* memory, (2) *Conscious* memory of animals and two degrees of this, (a) instincts, (b) acquired habits. (3) Self-conscious memory, or history of ego.

One pregnant thought we throw out by the way and pass on. It is interesting to note here, that man rises in the scale and approaches his ideal just in proportion as he departs from the characteristically animal. In animals the whole life and activity is concentrated in the now; man, on the contrary, by memory and imagination lives also in the past and the future. His life expands more and more backward and forward, until in the ideal man he lives equally in all time, past, present, and future. He weighs in equal balance all events without prejudice in favor of the now, and is thus, as it were, unconditioned by time. This is the ideal of wise or prudent conduct—the intellectual ideal. Again: in animals the whole life is concentrated on the self, although an unrecognised self. Man—and more and more in proportion as his distinctive human nature predominates—lives in and for other selves. His life expands and incorporates more and more the lives of others through sympathy and love. He reaches his ideal in this direction, when his life spreads equally over all other lives in proportion to their real worth—when self-love no longer in the least disturbs the justness of judgment or unduly influences conduct—when self and other selves are weighed in the same just balance. In a word, when he is unconditioned by self. This is the ideal of right conduct, the moral ideal. The moral law of equal love to self and neighbor is now fulfilled. But observe: the necessary condition and beginning of this whole process of improvement is the recognition of selfhood.

VII. WILL AND FREE-WILL.

The difference in this case is similar to the last, but it is even harder to draw the line of distinction sharply, because there are many degrees of freedom with almost insensible gradations between. There is, confessedly, no subject in philosophy more difficult than that of freedom of the will. I shall not attempt to define its exact nature. My attempt will be far less ambitious, but, as I believe, far more useful. I wish to show the various degrees of freedom in animal conduct, and that the most marked of these begins with man and is therefore characteristic of him.

There are some, yea many, in these latter days, who cut the Gordian knot of this difficulty by asserting that there is no such thing as free-will, nor indeed will of any kind such as we imagine. They assert that the animal, yea even the human, body, with all its functions, physiological and psychological, is naught else but pure mechanism—the whole phenomenon of life is naught else than action and necessary reaction between the external world and the nerve-centres. If the process is attended with consciousness, as it sometimes is, then we call the reaction will; but it is none the less necessary on that account. According to these philosophers, an animal or even man himself is a pure automaton; an automaton conscious of what is going on, but wholly unable to modify the automatic phenomena. Consciousness is present, true, but only as a passive, helpless observer. This view was presented in a masterly way by Professor Huxley in his memorable Belfast address in 1874. (*Nat.*, X., 362. 1874.)

To most persons (and I believe with reason) a sufficient answer to this is an appeal to consciousness itself; but the competency of the witness is disallowed by the other party. In default of this appeal, I believe the best answer is found in the *reductio ad absurdum.* Let us try it.

If consciousness be not a factor in the result of reaction of nerve-centres under the stimulus of sense-impression, then would this result, i. e., the conduct of animals be precisely the same if there were no consciousness. This seems sufficiently incredible; but more remains. If consciousness and self-consciousness be not a factor in human conduct, then history, or all the results of human activity, individual and social, would have been precisely the same as we now find it, even though there had never been any consciousness or self-consciousness at all. Society would have progressed, wars, revolutions, and parliamentary debates would have occurred; telegraphs, telephones would have been invented; railways and cotton-mills built; masterpieces of poetry, painting, and music achieved; science, art, philosophy, and religion would have arisen and blessed mankind. In fine, all details of work done and every word spoken or written would have been precisely the same, even though man was wholly unconscious of what was going on. Man's body and man's mind and human society, according to this view, may be compared to a complicated engine rushing along at a rapid rate without engineer, except necessity, or law, or what not. Consciousness is on the engine, true, but only as passenger. Although understanding clearly and sympathising deeply with every movement, though deeply affected with joy or grief, with hope or terror, wholly unable to modify the course of events. Everything happens by necessity, and would happen just the same even though consciousness were not present at all!! It seems to me impossible that any sane mind, unsophisticated with metaphysical subtleties and fully realising the logical consequences of this view, can for a moment maintain it.

And yet—and yet—most complicated and wonderful machinery in the animal and human body *does* work perfectly without consciousness. Complex, delicately adjusted, and appropriate purposive work *does* go on without conscious engineer. Here is the difficulty. How shall we explain it.

The animal body, as already said, is an instrument for action and reaction between the external and the internal world or nerve-centres. But there are *many degrees in the freedom of the reaction.* In the simplest and most automatic form, the steps of the process are briefly as follows: Action (*a*) sense-impression, (*b*) inward transmission, (*c*) change in a nerve-centre. Reaction (*d*) outward transmission, (*e*) muscular contraction, (*f*) change in external phenomena. In the simplest case this is all. Thus, if the spinal cord, or the medulla, be the centre, action is followed by reaction with certainty and precision, and the most complex movements may be perfectly and yet unconsciously executed. The whole series is in the domain of physiology. But if the centre be the cerebrum, then at least two more links are added to the chain from the domain of psychology. The incoming current determines changes, not only in the brain, but also in consciousness as sensations, perceptions, etc.; and the outgoing current is started, not by brain-changes alone, but by will. Now, if the incoming current started by sense-impression is followed immediately, like the rebounding of a ball, by the outgoing current determining movement, without the intervention of consciousness and will, then we call the movement reflex. On the contrary, if changes in consciousness and will intervene and control the result, then we call the movement voluntary. The reflex system operates in all parts of the body and in all animals; the conscio-voluntary is superadded in some of the movements of the higher animals, and then takes control. In these, therefore, the reflex underlies and conditions the conscio-voluntary, while the latter stands above and dominates the former. If the conscio-voluntary be paralysed, or its activity be suspended by sleep or coma, then the reflex is far more distinctly and universally operative.

Thus, then, there are two primary and strongly contrasted groups of animal movements, viz., the reflex or automatic, and the voluntary. But the great gap between these is almost wholly filled by gradations from each side approaching the other. In the reflex group there are (*a*) the purely automatic movements, wholly withdrawn from consciousness as well as from will, such are the movements of the heart, stomach, intestines, etc.; (*b*) then come movements withdrawn from will, but not from consciousness, such as swallowing, coughing, sneezing, etc.; (*c*) movements attended with consciousness and partly controlled by the will, such as breathing, etc. So also, on the other hand, are there voluntary movements in various degrees approaching the reflex. (1) Movements which are entirely voluntary—*deliberate* movements requiring the whole attention, and, in some cases of complex movements, even painful attention. Such are nearly all movements made for the first time. (2) *Habitual* movements. These require only dim consciousness and a general superintendence of the will. They are withdrawn from the full undivided consciousness, and are therefore *semi-automatic.* Ordinarily they go on without full consciousness or direct action of the will; but if anything goes wrong, consciousness and will quickly intervene to rectify, and they again relapse into semi-automatism. Walking, flying, speaking, writing, playing on a musical instrument, come under this head. They at first came under the first head, but were made easy and semi-automatic by frequent repetition. They are, therefore, *acquired by individual experience.* (3) Instinctive movements. These are still more automatic. They are the result, not of individual experience, like the last, but of *ancestral experience,* inherited through many generations. They are, therefore, withdrawn from individual experience, but not wholly from consciousness and will. (4) Reflex movements. These are finally withdrawn from consciousness and will, but in various degrees, as already shown.

Now, all these kinds of movements exist in animals as well as in man, although the first, i. e., the deliberately voluntary, only to a limited extent, and then only in the first formation of habits and instincts. Nearly all the so-called voluntary acts of animals are either habitual or instinctive, and are determined by impulses and not by motives. But in man there is still a higher form of activity not yet mentioned, viz.: that in which consequences, especially moral consequences, are presented to the mind and weighed; in which impulses, solicitations, motives, are balanced one against another; in which all these are again made the objects of conscious thought, and we are distinctly conscious of the fact that we ourselves are umpire and responsible for the result. The determining factor in this case is will in a *higher and freer* sense than in any of the preceding. This is the *free-will* characteristic of man. No such weighing of motives (if motives there be at all in them, and not mere impulses), no such reflexion on motives as objects of thought ever occurs or can occur in animals. We call this *free-will,* not because it is absolutely free and unconditioned, but because it is *freer* than any lower form. As already said, there are many degrees of freedom of activity. Instinctive acts are free in relation to reflex; habitual acts in relation to instinctive, and deliberate acts of animals in relation to habitual. So also self-determined moral acts are free in relation to all other lower forms. There is a gradually increasing freedom of activity as we go up the animal scale. The increase between animals and man is a great one, great not so much in amount, as in the new possibilities introduced then and there. But absolute freedom belongs to God alone.

Finally, we have already shown in several departments a human plane and higher human plane; that there is a human life as distinguished from animal life, and a higher human life as distinguished from a lower. So it is here, also. There is a free-will distinguishing man from animals, and a *freer* will distinguishing a higher from a lower type of man. There is a free-will which is free only in the sense of being self-determined and therefore morally responsible, but is nevertheless unwillingly restrained by, and chafes against the bounds set about it by the all-embracing will of God, which is the law of perfect righteousness—and there is a freer will, freer because no longer restrained by external law; because the law of righteousness is freely accepted as the law of its activity; because it moves freely in loving accord with the absolute will.

Out of these two last, viz.: *self-consciousness* and *free-will*, grow the moral and religious nature of man. These, therefore, must be characteristic of man. In fact, they are the most obvious of all characteristics. We do not count them among the primary characteristics, only because they so obviously flow from the simpler elements given above.

Now, of the seven characteristics enumerated above, which, if any, is most fundamental and essential—which, if any, precedes and determines all the others? Some have said *speech* is the most fundamental and preceded all others, even thought. Yes, surely *animal* speech did so precede—but is it not evident that at least some dim perception of relations as relations, or what I have called the power of words in relation to one another, must have preceded words expressing such relations, and therefore rational speech. Shall we say, then, that *thought*, or the perception of relations as relations, is the fundamental characteristic which we seek, and it therefore preceded speech? This seems, indeed, in some sense true: for a practical awareness of relations certainly precedes speech of any kind, much more, rational speech. But on the other hand, it is quite evident that words as the *sensible and transmissible* embodiment of the beginnings of thought are absolutely necessary for their growth into clearness—in fact, for the growth of *practical awareness* of relations into the clear perception of relations as relations abstracted from the things related. It seems to me that these two must always have acted and reacted on one another, and, therefore, must have developed together *pari passu.* As practical awareness of relations gradually developed into abstract ideas, so *pari passu* animal sounds gradually developed into animal speech, and animal speech into rational speech. All the other characteristics are similarly interrelated.

Or perhaps we may make one exception—perhaps there is one to which all others are contributory, and which, therefore, is last to arise—viz., *self-consciousness.* The abstraction of *self* from the facts of consciousness is the highest and most complex of all abstractions and may be regarded as the consummation of humanity. All the others may be likened to the labor-throes—this is the actual *birth.* All the others are like the breaking of day and the increasing twilight; this is the rising of the sun above the horizon of humanity. The discovery of self is the discovery of the world of *reality* underlying the world of phenomena. With that discovery man rises at one step into an entirely different plane of life.

JOSEPH LE CONTE.

UNIVERSITY OF CALIFORNIA.